CLAIMS

1. A magnetic head assembly having an air bearing surface (ABS) and comprising:

a write head including:

ferromagnetic first and second pole piece layers that have a yoke portion located between a pole tip portion and a back gap portion;

a nonmagnetic write gap layer located between the pole tip portions of the first and second pole piece layers;

an insulation stack with at least one coil layer embedded therein located between the yoke portions of the first and second pole piece layers;

the first and second pole piece layers being connected at their back gap portions;

the pole tip portion of the first pole piece having first and second components wherein the first component forms a portion of the ABS and the second component is recessed from the ABS and is magnetically connected to the first component; and

the second component having a width that is less than a width of the first component wherein said widths are parallel to the ABS and parallel to major thin film planes of the layers of the sensor.

2. A magnetic head assembly as claimed in claim 1 further comprising:

the first pole piece layer having a third component that is recessed from the ABS and has a width that is parallel to the ABS and the major thin film planes of the layers of the sensor;

the second component interconnecting the first and third components; and

the width of the third component being greater than the width of the second component.

3. A magnetic head assembly as claimed in claim 1 further comprising:

the first pole piece layer having a base layer and a pedestal wherein the pedestal forms a portion of the ABS; and

the pedestal interconnecting the base layer and the first component.

4. A magnetic head assembly as claimed in claim 1 further comprising:

a read head including:

a read sensor;

nonmagnetic electrically nonconductive first and second read gap layers;

the read sensor being located between the first and second read gap layers;

a ferromagnetic first shield layer; and

the first and second read gap layers being located between the first shield layer and the first pole piece layer.

5. A magnetic head assembly as claimed in claim 4 further comprising:

the first pole piece layer having a third component that is recessed from the ABS and has a width that is parallel to the ABS and the major thin film planes of the layers of the sensor;

the second component interconnecting the first and third components; and

the width of the third component being greater than the width of the second component.

6. A magnetic head assembly as claimed in claim 5 further comprising:

the first pole piece layer having a base layer and a pedestal wherein the pedestal forms a portion of the ABS; and

the pedestal interconnecting the base layer and the first component.

7. A magnetic disk drive including at least one magnetic head assembly that has an air bearing surface (ABS) and that includes a write head and a read head, comprising:

the write head including:

ferromagnetic first and second pole piece layers that have a yoke portion located between a pole tip portion and a back gap portion;

a nonmagnetic write gap layer located between the pole tip portions of the first and second pole piece layers;

an insulation stack with at least one coil layer embedded therein located between the yoke portions of the first and second pole piece layers;

the first and second pole piece layers being connected at their back gap portions;

the pole tip portion of the first pole piece having first and second components wherein the first component forms a portion of the ABS and the second component is recessed from the ABS and is magnetically connected to the first component; and

the second component having a width that is less than a width of the first component wherein said widths are parallel to the ABS and parallel to major thin film planes of the layers of the sensor;

a read head including:

a read sensor;

nonmagnetic electrically nonconductive first and second read gap layers;

the read sensor being located between the first and second read gap layers;

a ferromagnetic first shield layer; and

the first and second read gap layers being located between the first shield layer and the first pole piece layer;

a housing;

a magnetic disk rotatably supported in the housing;

a support mounted in the housing for supporting the magnetic head assembly with said ABS facing the magnetic disk so that the magnetic head assembly is in a transducing relationship with the magnetic disk;

a spindle motor for rotating the magnetic disk;

an actuator positioning means connected to the support for moving the magnetic head assembly to multiple positions with respect to said magnetic disk; and

a processor connected to the magnetic head assembly, to the spindle motor and to the actuator for exchanging signals with the magnetic head assembly, for controlling movement of the magnetic disk and for controlling the position of the magnetic head assembly.

8. A magnetic disk drive as claimed in claim 7 further comprising:

the first pole piece layer having a third component that is recessed from the ABS and has a width that is parallel to the ABS and the major thin film planes of the layers of the sensor;

the second component interconnecting the first and third components; and

the width of the third component being greater than the width of the second component.

9. A magnetic disk drive as claimed in claim 7 further comprising:

the first pole piece layer having a base layer and a pedestal wherein the pedestal forms a portion of the ABS; and

the pedestal interconnecting the base layer and the first component.

10. A magnetic disk drive as claimed in claim 9 further comprising:

the first pole piece layer having a third component that is recessed from the ABS and has a width that is parallel to the ABS and the major thin film planes of the layers of the sensor;

the second component interconnecting the first and third components; and

the width of the third component being greater than the width of the second component.

11. A method of making a magnetic head assembly having an air bearing surface (ABS) and comprising the steps of:

making a write head including the steps of:

forming ferromagnetic first and second pole piece layers that have a yoke portion located between a pole tip portion and a back gap portion;

forming a nonmagnetic write gap layer between the pole tip portions of the first and second pole piece layers;

forming an insulation stack with at least one coil layer embedded therein between the yoke portions of the first and second pole piece layers;

connecting the first and second pole piece layers at their back gap portions;

forming the pole tip portion of the first pole piece with first and second components wherein the first component forms a portion of the ABS and the second component is recessed from the ABS and is magnetically connected to the first component; and

forming the second component with a width that is less than a width of the first component wherein said widths are parallel to the ABS and parallel to major thin film planes of the layers of the sensor.

12. A method of making a magnetic head assembly as claimed in claim 11 further comprising the steps of:

forming the first pole piece layer with a third component that is recessed from the ABS and with a width that is parallel to the ABS and the major thin film planes of the layers of the sensor;

forming the second component interconnecting the first and third components; and

forming the width of the third component greater than the width of the second component.

13. A method of making a magnetic head assembly as claimed in claim 11 further comprising the steps of:

forming the first pole piece layer with a base layer and a pedestal wherein the pedestal forms a portion of the ABS; and

forming the pedestal interconnecting the base layer and the first component.

14. A method of making a magnetic head assembly as claimed in claim 11 further comprising the steps of:

making a read head including the steps of:

forming a read sensor;

forming nonmagnetic electrically nonconductive first and second read gap layers with the read sensor located between the first and second read gap layers; and

forming a ferromagnetic first shield layer with the first and second read gap layers located between the first shield layer and the first pole piece layer.

15. A method of making a magnetic head assembly as claimed in claim 14 further comprising the steps of:

forming the first pole piece layer with a third component that is recessed from the ABS and with a width that is parallel to the ABS and the major thin film planes of the layers of the sensor;

forming the second component interconnecting the first and third components; and

forming the width of the third component greater than the width of the second component.

16. A method of making a magnetic head assembly as claimed in claim 15 further comprising the steps of:

forming the first pole piece layer with a base layer and a pedestal wherein the pedestal forms a portion of the ABS; and

forming the pedestal interconnecting the base layer and the first component.

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